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Response of soil microbial community to the simultaneous influence of metals and an organic substance

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Abstract

© 2015, Pleiades Publishing, Ltd. Organic substances and metals multidirectionaly influence soil microorganisms. The results of an evaluation of the response of the soil microbial community to the simultaneous application of organic substance and metals which are a part of compost from the sewage sludge are presented. For two seasons after soil treatment, the increase in Corg to 2.1 ± 0.4% and that in Cd, Cr, Cu, Ni, Pb, and Zn mobile forms to 1.1 ± 0.03, 3.8 ± 0.8, 6.0 ± 1.2, 2.1 ± 0.5, 3.2 ± 0.7, and 12.3 ± 2.7 mg/kg correspondingly resulted in the growth of microbial biomass in comparison with a control soil. The respiratory activity of the treated soils increased during the first season and decreased to the level of control plots by the end of the second season. The value of a metabolic quotient did not exceed the control level. An analysis of the principal components of the obtained data revealed that the major factor determining the variability of the microbial community is the alteration of the content of organic substance in the soil.

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Keywords

composts, metabolic quotient, metals, microbial biomass, respiration, soil